

What is claimed is:

1. A method for treating obesity in a mammalian patient, comprising determining whether or not the patient carries at least one melanocortin 4 (MC4) receptor mutation that is associated with obesity and, if the patient carries such a mutation, administering an amount of a non-toxic melanin concentrating hormone (MCH) receptor antagonist effective to reduce either or both of (1) food consumption or (2) body mass index of the patient upon sustained administration.
2. A method according to claim 1, wherein the MCH receptor antagonist has a molecular mass less than 700 a.m.u. and is nonpeptidic.
3. A method according to claim 1, wherein the MCH receptor antagonist has no detectable MCH receptor agonist activity.
4. A method according to claim 1, wherein the MCH receptor antagonist binds to an MCH receptor with a  $K_i$  that is less than 1 micromolar.
5. A method according to claim 1, wherein the MCH receptor antagonist binds to an MCH receptor with a  $K_i$  that is less than 100 nanomolar.
6. A method according to claim 1, wherein the MCH receptor antagonist is administered orally.
7. A method according to claim 1, wherein the MCH receptor antagonist is administered by injection.
8. A method according to claim 1, wherein the determination of whether or not the patient carries an MC4 receptor mutation is performed via PCR using a sample of a tissue or body fluid obtained from the patient.
9. A method for treating obesity in a patient carrying at least one MC4 receptor mutation that is associated with obesity, comprising administering an effective

amount of a non-toxic MCH receptor antagonist to a patient previously determined to carry such a mutation.

10. A method according to claim 9, wherein the MCH receptor antagonist has a molecular mass less than 700 a.m.u. and is nonpeptidic.

11. A method according to claim 9, wherein the MCH receptor antagonist has no detectable MCH receptor agonist activity.

12. A method according to claim 9, wherein the MCH receptor antagonist binds to an MCH receptor with a  $K_i$  that is less than 1 micromolar.

13. A method according to claim 9, wherein the MCH receptor antagonist binds to an MCH receptor with a  $K_i$  that is less than 100 nanomolar.

14. A method according to claim 9, wherein the MCH receptor antagonist is administered orally.

15. A method according to claim 9, wherein the MCH receptor antagonist is administered by injection.

16. A method for preventing obesity in a mammalian patient, comprising determining whether or not the patient carries at least one MC4 receptor mutation that is associated with obesity and, if the patient carries such a mutation, administering an effective amount of a non-toxic melanin concentrating hormone (MCH) receptor antagonist, and thereby preventing obesity in the patient.

17. A method according to claim 16, wherein the MCH receptor antagonist has a molecular mass less than 700 a.m.u. and is nonpeptidic.

18. A method according to claim 16, wherein the MCH receptor antagonist has no detectable MCH receptor agonist activity.

19. A method according to claim 16, wherein the MCH receptor antagonist binds to an MCH receptor with a  $K_i$  that is less than 1 micromolar.
20. A method according to claim 16, wherein the MCH receptor antagonist binds to an MCH receptor with a  $K_i$  that is less than 100 nanomolar.
21. A method according to claim 16, wherein the MCH receptor antagonist is administered orally.
22. A method according to claim 16, wherein the MCH receptor antagonist is administered by injection.
23. A method according to claim 16, wherein the determination of whether or not the patient carries an MC4 receptor mutation is performed via PCR using a sample of a tissue or body fluid obtained from the patient.
24. Use of a MCH receptor antagonist for prevention or treatment of obesity in a patient previously determined to carry at least one MC4 receptor mutation.